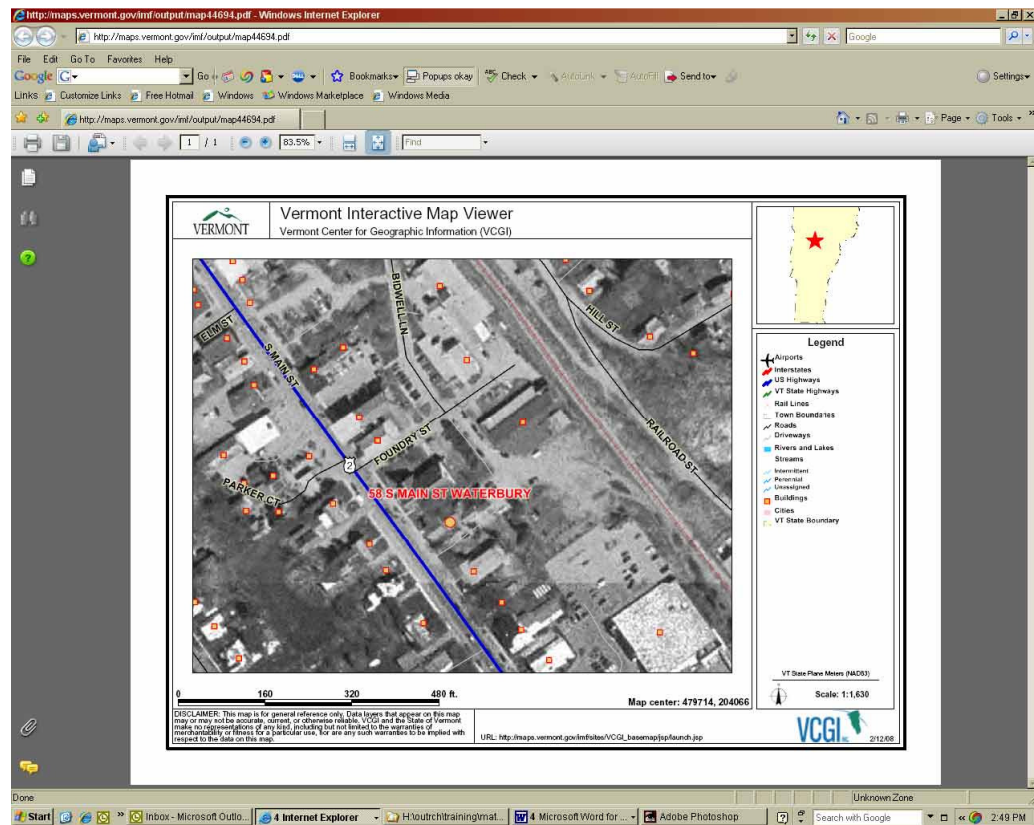## *Chapter 7: Creating Map Layouts- Printing and Exporting*

In this Exercise:

- The Basic Map
- The Layout View – Adding Map Elements
- Notes on Finishing the Map
- Printing and Exporting the Map
- Online Resources: Cartography

The Basic Map

In Exercise 1, we used the online Vermont Interactive Map Viewer to view geographic data and create a map.

The map included the map image as well as a Title, Map Legend, North Arrow, Scale Bar, and descriptive text.

Maps should include each of these elements so that output may clearly relate the intended information to the anticipated audience.
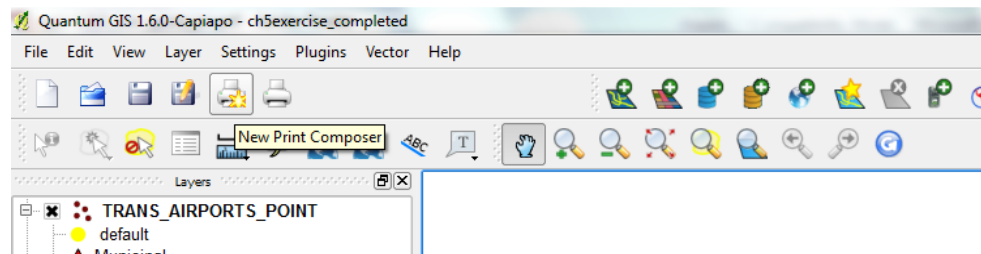
The Print Composer – Adding Map Elements

Opening the Print Composer provides you with a blank canvas to which you can add the current QGIS map canvas, legend, scalebar, images, basic shapes, arrows and text. The print composer provides two tabs:

- The **General** tab allows you to set paper size, orientation, the print quality for the output file in dpi and to activate snapping to a grid of a defined resolution. Please note, the Snap to grid feature only works, if you define a grid resolution > 0. Furthermore you can also activate the Print as raster checkbox. This means all elements will be rastered before printing or saving as Postscript of PDF.
- The **Item** tab displays the properties for the selected map element. Click the Select/Move item icon to select an element (e.g. legend, scalebar or label) on the canvas. Then click the Item tab and customize the settings for the selected element.
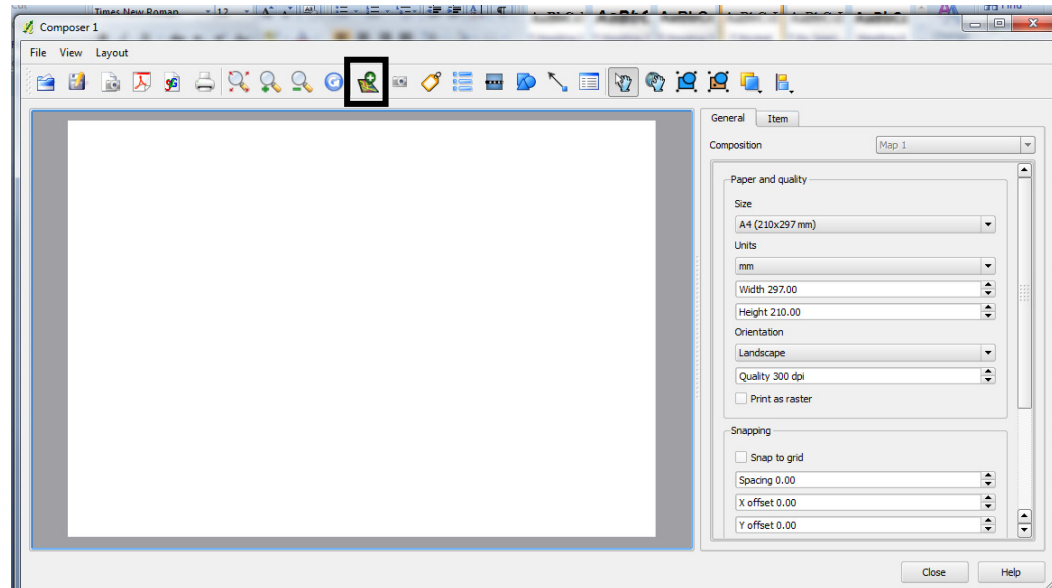
You can add multiple elements to the composer. It is also possible to have more than one map view or legend or scalebar in the print composer canvas. Each element has its own properties and in the case of the map, its own extent. If you want to remove an elements from the composer canvas. you can do that with the delete or the backspace key.

1. **Opening The Print Composer**

   a) Open QGIS and the project file **ch5exercise.qgs**, or another project you have created.

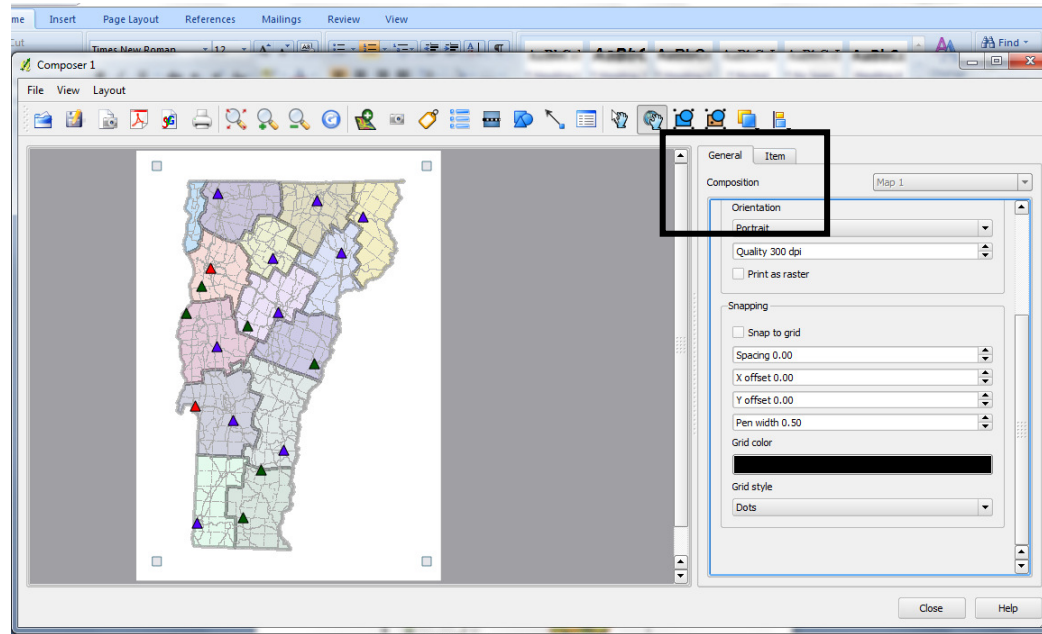   b) Click on the "New Print Composer" button on the tool bar

   c) At first, the window has only a blank canvas, because we need to add all of the elements. Hold your cursor over each icon/button to see what it does.

d) To add the map canvas, click on the "Add new map" button in the print composer toolbar and drag a rectangle on the composer canvas with the left mouse button to add the map. To display the current map, you can choose between three different modes in the map Item tab:

i) *Preview Rectangle* is the default setting. It only displays an empty box with a message "Map will be printed here".
ii) *Preview Cache* renders the map in the current screen resolution. If case you zoom in or out the composer window, the map is not rendered again but the image will be scaled.
iii) *Preview Render* means that if you zoom in or out the composer window, the map will be rendered again, but for space reasons, only up to a maximum resolution.

e) You can resize the map element by clicking on the "Select/Move item" icon (blue hand with arrow), selecting the element, and dragging one of the blue handles in the corner of the map. With the map selected, you can now adapt more properties in the map Item tab. To move layers within the map element select the map element, click the "Move item content" icon (blue hand with globe) and move the layers within the map element frame with the left mouse button.

f) In order to control how your map fills the map element, you can change the Width, Height, or Scale in the Map section of the Item tab (when the map element is chosen). Change the Scale of your map element to 1,000,000 (meaning 1:1,000,000), or whatever makes your map fill most of the map element box. You may need to adjust this if you resize your map element.
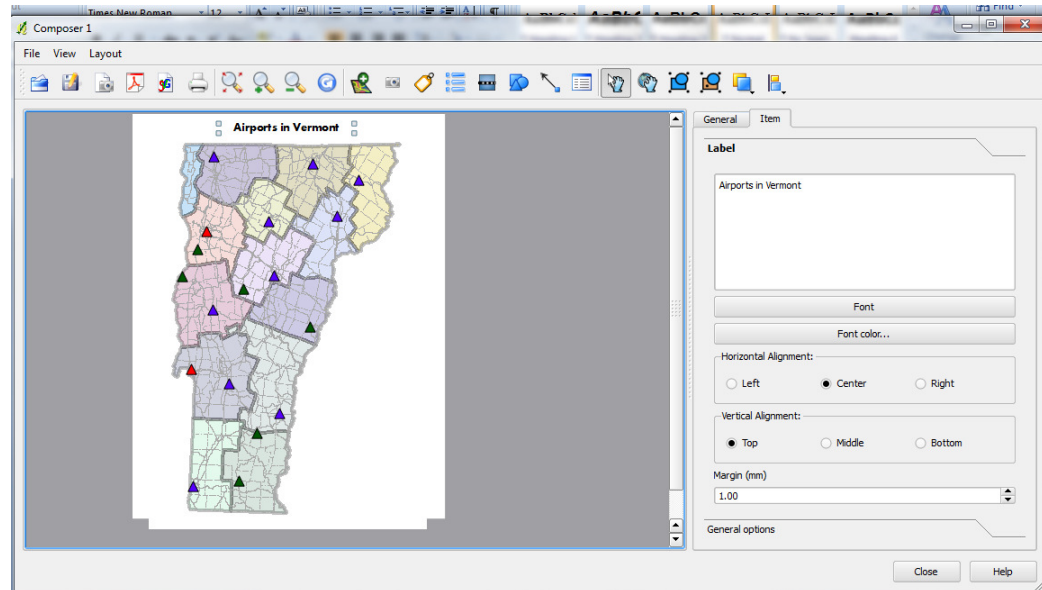
2. Page Setup

a) To change size or orientation of your print canvas (final map) switch from the "Item" tab to the "General" tab.

b) Change Size to "Custom," Units to "inch,"Width" to 8.5 inches, Height to 11 inches., Orientation to "Portrait," and Quality to 150 dpi.
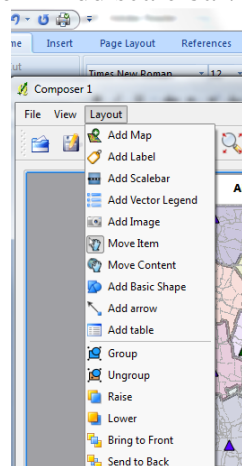
3. Adding Elements - Title

a) Besides adding a map canvas to the Print Composer, it is also possible to add, position, move and customize legend, scalebar, images and label (title and other text) elements. Each of these elements can be added with the corresponding button on the tool bar or from the "Layout" menu.

b) Add a title to your map by clicking on the "Add new label" button and notice that the Item tab on the right immediately provides a place to type in the text, change font, colors, alignment, etc. You can also turn off the frame around the label box. Make it look nice!

c) You can re-position the title by putting your cursor over it anywhere other than an edge. When your cursor is over an edge, it can resize the box.

4. Adding a Scale Bar

a) Click on the word Layout on the tool bar to open the Layout menu. You will see the many options that exist for other elements to add to your map. Click on "Add scale bar."
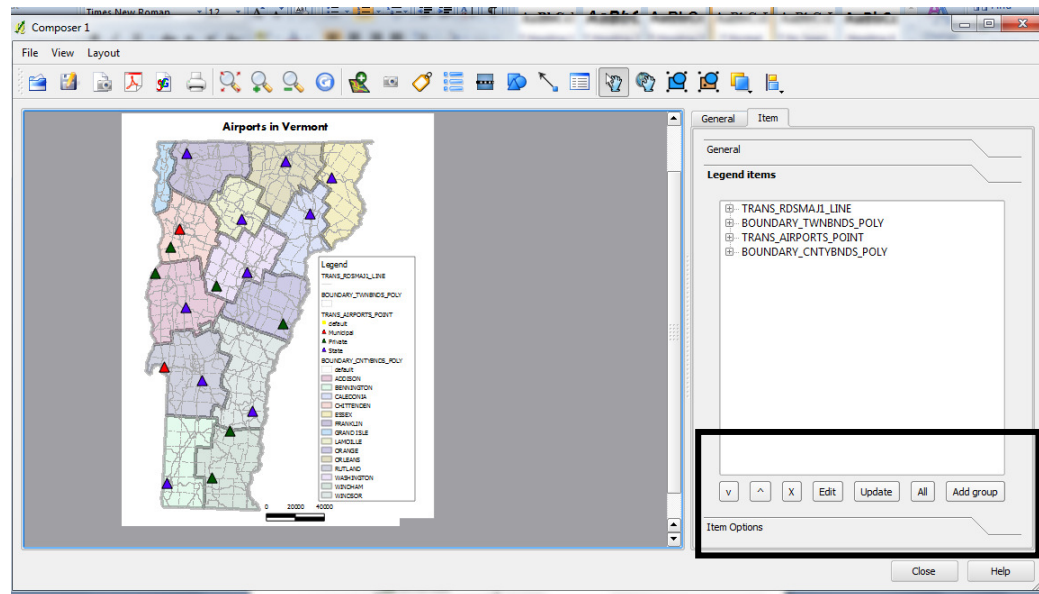

b) Click anywhere on the map to place the scale bar and then adjust settings in the Item tab on the right. You will notice that we are limited to using the units specified in the Coordinate System (meters, in VT).

3. Adding a Legend

a) Click on the Map Element in the Layout.

b) Click on the "Add new vector legend" button in the toolbar.

c) Click anywhere on the map to place the legend.

A Legend is one of the most critical map elements because it describes the data the viewer will see on the map. Labels and symbols should be designed to be clear and easily understood by the intended audience.

d) You can now change the order of legend elements in the "Item options" section of the Item tab on the right. You can also edit the names of the various legend elements, and remove layers (from the legend) if necessary. If you remove layers and then realize you want them back, you can simply click on the "All" button to restore the original list of layers (with original names).

e) Click on the "General" portion of the Item tab to change the title of the Legend to "Map Legend." Play with the various font options to see what changes (group font, layer font, item font).

Notes on Finishing the Map

Creating a **clear** and **visibly appealing** map depends on many items including the elements discussed in the steps above.

Adding more **text** is typically necessary and should at minimum include information about who created the map and the date.

The map should include elements at an **appropriate scale** so that text and map features are clearly visible without being too large or too small.

The map should make use of the **visible space** in a layout where elements are well spaced on the page.
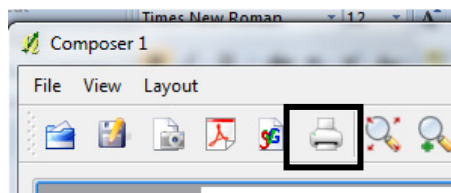
Printing and Exporting the Map

Printing and/or Exporting the map as it appears in the Print Composer is the final step.

1. **Printing**

   a) To Print click on the menu to select:
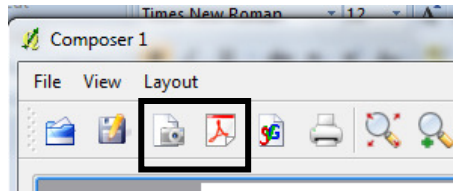
   File
   ↳ **Print**

   b) Or, use the print button in the toolbar

   c) In the Print window select options that define the printer and page settings

2. **Exporting**

   a) Your export options include Export to PDF and Export to image. You can access these options from the File menu or via the buttons on the tool bar.

b) If you choose "Export as image" the "Save map image as" window appears asking you where you would like to save it, what name you would like to give it, and what format you would like to save to.

c) Click "save" once you have filled in the relevant information.

Online Resources: Cartography

For more information about cartography and map design download the document "Introduction to Map Design" (in Adobe PDF format) from the ESRI website: www.esri.com/industries/k-12/download/docs/intrcart.pdf